

## The Amateur in You, Part 2

*What have you been pondering?*



### Basic lightning protection

As most realize, there aren't many parts of our country that are immune to lightning strikes. As a result, people who have antennas installed on their roof tops wonder whether they should do something to prevent damage to their equipment from the effects of lightning. On one hand, some hams run to their radios when a storm approaches, and disconnect their coax. On the other hand, if they're away from home, that's not always possible or practical. Should you simply keep your coax disconnected, until you need to get on the air?

### Repeater station

If you visit a repeater site, you'll likely find a ham radio a lot like your own, located in a small building. Attached to the radio is a length of coax, that connects it to an antenna, which is typically installed up on a tower, whose base is just feet from the building. Because the tower is on top of a mountain, it gets struck by lightning numerous times throughout the year. So, when a lightning storm approaches the mountain, do you think there's somebody who races up the mountain each time, and disconnects all of the repeater's coaxial cables?

In fact, nobody flies up to the repeater each time it starts raining, that we know of. Instead, a repeater is connected by coax to an antenna and tower that's properly grounded. This *proper grounding* diverts most of the lightning energy to ground, protecting the repeater and all of its associated gear. The same grounding methods can be applied to your home station, to protect it from lightning damage, but you really don't need to, or even want to. You don't need to install a commercial-grade grounding system, because chances are, your home will never receive a direct lightning strike. And you don't want to,

because the cost of doing so is very high, beyond the reach of the common folk.

### What are the odds?

First, it's much more likely that lightning will strike a few blocks away from you, than right at your house. Is it possible for it to strike your house? Sure it is, but highly unlikely, because your house doesn't offer the cloud much reason to complete an electrical path. Yes, it would be nice to protect your home and all your gear from a direct lightning strike, but in reality what you're trying to protect it from is either a *nearby strike* or *static buildup*, which are much more likely.



*Bare 4 AWG ground wire clamped to the J-pole mast, opposite from the side of the LMR-400 coax*

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### *Basic lightning protection, continued*



Second, when lightning does strike nearby, or if static builds up because of wind or blowing dust or moving clouds, that static can collect. And once enough charge collects on your antenna, that electrical imbalance needs to find a path to ground, and often that path is through your equipment. The object, then, is to give that static buildup a place to go before it reaches that critical level.

### Minimal protection setup

Here are some practical and inexpensive things you can do, to apply some basic lightning and static protection into your antenna system:

- Drive two eight-foot-long half-inch ground rods into the dirt about a foot away from your house, one just below your antenna, and the other about half-way around your house to the electrical service box
- Connect a length of 4 gauge or 6 gauge bare copper wire between the two ground rods, then connect another length of 4 or 6 gauge bare copper wire from the electrical service box to the ground rod closest to it
- Connect a length of 4 or 6 gauge bare copper wire from the base of the antenna or its mast (if the ground part of the antenna is electrically connected to the mast) to the ground rod below it

At this point, your grounding system should protect your equipment adequately if your antenna is a *J-pole*, because the ground on a *J-pole* is typically higher in elevation than its radiating element. If your antenna is any other type, its radiating element will likely be higher in elevation than the ground portion, leaving the radiating side with little or no connection to ground. If or when you're ready to ground the radiating portion of your antenna, do this:

- Install a *lightning arrester* onto the ground rod below your antenna
- Connect a length of coax from your antenna to the lightning arrester, then another length of coax from the other side of the lightning arrester to your radio

There are more things you can do, towards making your antenna system completely lightning-proof, but that's not the purpose of this brief overview. If you really want to install a commercial-grade site, and you have the means to do so, it should be able to weather just about any storm. The basic installation described here, however, should provide your equipment with some *adequate* protection from most typical storms and static charge buildup at your home.



*Ground rod connection, with each coax going through a grounded lightning arrester, plus a 4 AWG ground wire for the antenna*